Math 1
Flipbook Project

For this project, you will create a flipbook to simulate the motion of at least two different objects. You will also create a short story to accompany your flipbook. You will also need to provide the mathematics to justify the placement of your objects on each page.

One option for the flipbook is to have two objects travelling along the same horizontal line. We can measure time t by the page number. The equation for the (horizontal) position of each object needs to be of the form

$$x = mt + b.$$

We can use subscripts to distinguish between the equations of the two objects:

$$\text{object 1: } x_1 = m_1 t + b_1$$
$$\text{object 2: } x_2 = m_2 t + b_2$$

Note that t does *not* have a subscript, since the page number should be the same for both objects.

For the above option, your two objects need to intersect on a page of the flipbook, and that page cannot be the first page. You must supply algebraic evidence (such as solving an equation, providing a graph of position versus time, making a table, etc.) that the page number at which the two objects intersect is consistent with the equations that you use to define the positions of the objects.

Another option for the flipbook is to have two objects travelling along different lines. The two lines must intersect within the space and time frame of the flipbook. Also, both objects must pass through this point of intersection; however, they do not have to reach this point at the same time. For each object, you will need an equation for *both* its horizontal position and its vertical position. These equations need to be of the form

$$\begin{cases} x &= at + b \\ y &= ct + d. \end{cases}$$

Just like for the previous option, we can use subscripts to distinguish between the equations of the two objects; however, t should *not* have a subscript.

For the above option, you must supply algebraic evidence that the location of the intersection of the two lines as well as the page number at which each object passes through that point is consistent with the equations that you use to define the positions of the objects.

For all flipbooks, at least two objects must appear on every page of the flipbook.

This project is due the day after the exam for Module 2. Once I know this date, I will post it on the subbie wiki and the exam calendar.

Regardless of how you complete your flipbook, if you are creating a physical flipbook, you need to complete all of the following:

- title page (not graph paper) on flipbook
- page numbers on all pages used for the flipbook (at least ten pages)
- scale on first page of flipbook (most likely "page zero")
- objects in correct location on every page used for the flipbook
- separate sheet of paper with mathematical details including all equations relating to positions of objects and intersection
- separate sheet of paper with short story (with the same title as the flipbook)

Your name needs to be on the title page of the flipbook and each sheet of paper that you turn in that is not part of the flipbook.

You may investigate creating an electronic version of your flipbook. In that case, I do not need a physical flipbook; however, I will need to see your flipbook, and I will still need your mathematical details and short story.

I will be assessing your flipbook as follows:

For C2 (reading), you will earn a green bar if you turn in all materials on time, completed to the best of your ability and as neat as possible, having followed all directions. You will earn a yellow bar if you followed most (but not all) of the directions and/or materials are not as neat as possible, but still readable and/or at least one item is turned in slightly late. You will earn a red bar if some materials are late or missing, several items were completed without following directions, and/or anything is illegible.

For C3 (written communication), you will earn a green bar if your story is creative, well written, and corresponds with the action of the flipbook and if your story has minimal issues with spelling, grammar, and punctuation. You will earn a yellow bar if there are minor issues in at least two of these areas. You will earn a red bar if there are minor issues in more than two of these areas or if there is a major issue in at least one of these areas.

For C4 (notation), you will earn a green bar if the scale you use is consistent throughout the flipbook, all equations you create coincide with the action of the flipbook, and all objects appear reasonably close to the places indicated by the equations. You will earn a yellow bar if the scale is consistent, but there are at most three minor errors with the placement of the objects. You will earn a red bar if the scale is inconsistent or nonexistent, or if there are more than three minor errors or a major error with the placement of the objects.

If you choose to create an electronic flipbook, you may earn credit in C6 (technology). I will assess this based on how well you used that technology to complete the project.

For 2D (systems, algebra) or 2E (systems, matrices) depending upon which method you use to solve for the intersection, you will earn a green bar if you determine the intersection correctly or if there is a minor error, but the intersection you provide is close to the actual intersection. You will earn a yellow bar if there is a minor error that causes the intersection you provide to be sufficiently far from the actual intersection. You will earn a red bar if there is a major error in determining the intersection or if you do not make an attempt to determine the intersection. In the last case (no attempt at determining the intersection), you will earn a 1 in both 2D and 2E as well as earn a red bar in C2. If you use a table to determine the intersection but do not solve for it algebraically, you will earn at best a 5 in standard 2D.